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BREWING DEVICE FOR BEVERAGES17302 U.S. PTO
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CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This is the first application filed for the present invention.

BACKGROUND OF THE INVENTION**1) Field of the Invention**

[0002] The invention relates to a brewing device for beverages and in particular to a cup shaped member including a brewing device in which an infusion material is infused with a liquid. It also relates to a method to provide an infusion beverage.

2) Description of the Prior Art

[0003] It is well known that drinking coffee, tea, or other infused liquid is a habit that extends from nearly every home to the work place. Preparing a cup of coffee, for example, requires a coffee making equipment which is designed from the more simple coffee pot to complicated coffee machines. This either takes too much time or relies on very expensive pieces of equipment.

[0004] The prior art is loaded with coffee machine equipments. However, the field of disposable cups which readily provide a cup of coffee, or another infusible material, is somewhat restricted and has not offered a device which gives complete satisfaction. For example, U.S. Patent 2,915,176 suggests placing a wafer of a beverage concentrate at the bottom of the cup. U.S. Patent 4,134,492 suggests adding a concentrate at the bottom of the cup and placing an expandable plastic film liner over it with the intention of piling a plurality of cups over one another. These two designs are of course not suitable for preparing a cup of good quality coffee. U.S. Patent 4,306,492 discloses an apparatus for making a coffee beverage. The apparatus, which is provided with a cup, encloses a filter bag, filled with a portion of coffee. A bellows member is formed beneath the cup and separated by a perforated wall. The bellows member provides a pump-like action driving a current of water transversely through the filter bag.

SUMMARY OF THE INVENTION

[0005] Accordingly, an object of the present invention is to provide a device which is cheap and easy to manufacture, while allowing to obtain good quality coffee in a fast and easy way.

[0006] Yet another object of the present invention is to provide a device which does not require the purchase and management of bulk coffee.

[0007] Still another object of the present invention is to provide a system which prevents the accumulation of garbage since disposal of the device in accordance with the invention is the responsibility of the user.

[0008] It is a further object of the present invention to provide an infusion device which substantially decrease the cost of making coffee and the maintenance cost and in which the products offered are unlimited.

[0009] It is another object of the invention to provide a system for infusing an infusable material without impregnating it with different aromas.

[0010] The present invention is a device for infusing an infusable material with an infusion liquid and providing a drinkable portion of an infused liquid. The device comprises

a cup shaped member having lateral walls and a bottom portion;

the bottom portion having an infusion chamber containing the infusable material;

a source of infusion liquid and means enabling communication between the source of infusion liquid and the infusion chamber;

the infusion chamber provided with one way inlet means and one way outlet means;

the one way inlet means arranged to force the infusion liquid into the infusion chamber and to infuse the infusable material therein;

the one way outlet means arranged to allow infused liquid to exit from the infusion chamber into the cup shaped member and to fill the cup shaped member; and

means to provide an amount of infusion liquid sufficient only to constitute the drinkable portion.

[0011] The present invention is also a cup for infusion beverages. The cup comprises:

a cup shaped member having lateral walls with an upper portion and a lower portion;

an infusion chamber disposed in the cup shaped member, the infusion chamber having a first opening and a second opening;

a inlet membrane communicating with the first opening of the infusion chamber and sealingly mounted on the infusion chamber, the inlet membrane allowing the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid;

an outlet membrane communicating with the second opening of the infusion chamber and mounted on the infusion chamber, the outlet membrane allowing the passage of the infusion liquid outside the infusion chamber into the cup shaped member; and

securing means for sealingly mounting the infusion chamber on the cup shaped member.

[0012] The present invention is also a brewing device for a cup shaped member. The brewing device comprises:

an infusion chamber having a first opening and a second opening;

an inlet membrane communicating with the first opening of the infusion chamber and sealingly mounted on the infusion chamber, the inlet membrane allowing the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid;

an outlet membrane communicating with the second opening of the infusion chamber and mounted on the infusion chamber, the outlet membrane allowing the passage of the infusion liquid outside the infusion chamber into the cup shaped member; and

securing means for mounting the brewing device on the cup shaped member.

[0013] The present invention is also a device for providing a drinkable portion of an infused liquid. The device comprises:

a cup shaped member having lateral walls with an upper portion and a lower portion;

an infusion chamber disposed in the cup shaped member, the infusion chamber having a first opening and a second opening;

an inlet membrane communicating with the first opening of the infusion chamber and sealingly mounted on the infusion chamber, the inlet membrane allowing the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid;

an outlet membrane communicating with the second opening of the infusion chamber and mounted on the infusion chamber, the outlet membrane allowing the passage of the infusion liquid outside the infusion chamber into the cup shaped member;

securing means for mounting the infusion chamber on the cup shaped member;

a source of infusion liquid;

liquid communication means permitting a liquid flow between the source of infusion liquid and the infusion chamber through the inlet membrane; and

controlling means to supply an amount of infusion liquid sufficient only to fill the cup shaped member.

[0014] The present invention is also a method to provide an infusion beverage. The method comprises:

providing a cup for infusion beverages in accordance with an aspect of the invention;

providing a source of infusion liquid;

providing liquid communication means permitting a liquid flow between the source of infusion liquid and the infusion chamber through the inlet membrane;

providing controlling means to supply an amount of infusion liquid sufficient only to fill the cup shaped member;

connecting the inlet membrane of the cup and the liquid communication means; and

activating the source of infusion liquid to generate the transfer of the amount of infusion liquid into the cup.

[0015] The present invention concerns a cup for infusion beverages which includes a brewing device that permits to produce fast, cheap, easy to manufacture, and good quality infusion beverages, such as coffee. The cup of the invention comprises a cup shaped member having lateral walls with an upper portion and a lower portion. An infusion chamber is disposed in the bottom portion of the cup shaped member and has a first opening and a second opening. An inlet and an outlet membranes communicate respectively with the first and the second openings of the infusion chamber. The inlet membrane is sealingly mounted on the infusion chamber and allows the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid. The outlet membrane allows the passage of the infusion liquid outside the infusion chamber into the cup shaped member. The brewing device is sealingly mounted on the cup shaped member.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] These and other features, aspects and advantages of the present invention will become better understood with regard to the following description and accompanying drawings wherein:

[0017] FIG. 1 is a perspective view of a beverage cup including a brewing device in accordance with a preferred embodiment of the present invention;

[0018] FIG. 2 is a longitudinal cross-section view of the beverage cup including the brewing device of the preferred embodiment;

[0019] FIG. 3 is a longitudinal cross section view of the brewing device of the preferred embodiment;

[0020] FIG. 4 is an exploded view of the brewing device of Fig. 3;

[0021] Fig. 5 is a perspective view of the beverage cup including the brewing device of the preferred embodiment, disposed on a hot water filling base; and

[0022] Fig. 6 is a front elevation view of the beverage cup including the brewing device of the preferred embodiment, wherein a needle is inserted into the brewing device.

[0023] It will be noted that throughout the appended drawings, like features are identified by like reference numerals.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0024] Embodiments of the invention will now be described with reference to the drawings wherein like numerals refer to like parts.

[0025] Referring simultaneously to FIGS. 1 and 2, it will be seen that the assembly in accordance with the invention includes a cup shaped member 20 and a brewing device 38. Cup shaped member 20 has lateral walls 22 of standard construction with interior and exterior surfaces 24, 26, the lateral walls 22 having an upper portion 28 and a lower portion 30. Upper portion 28 of lateral walls 22 terminates into a rim 32.

that defines a drinking aperture 34 in cup shaped member 20. Lower portion 30 of lateral walls 22 terminates with an edge 36.

[0026] Brewing device 38 is mounted in lower portion 30 of cup shaped member 20 as will be explained in detail later. Brewing device 38 includes a lower member 40 sealingly mounted on lower portion 30 of lateral walls 22 and an upper member 42 sealingly mounted on lower member 40. Upper member 42 is also sealingly mounted on lower portion 30 of brewing device 38. However, it could be mounted on any part of the brewing device 38 or cup shaped member 20 as will be appreciated by one skilled in the art. Lower member 40 and upper member 42 together define an infusion chamber 44 wherein the infusion material, such as coffee, tea or herbal tea, (not shown) is located. Brewing device 38 also includes an input membrane 46 associated with lower member 40, that allows an infusion liquid, such as water, to enter infusion chamber 44 and an output membrane 48 that is associated with upper member 42 and permits the infused liquid to exit from infusion chamber 44 into a container portion 49 of the cup shaped member 20. Input and output membranes are made of a material that returns to its original shape and resume its sealing properties either after a thin object such as a needle has been inserted therein or the peripheral portion of the membrane is slightly deformed due to pressure applied thereon. In a preferred embodiment, input and output membranes 46, 48 are silicon membranes.

[0027] More specifically, referring simultaneously to FIGS. 3 and 4, it will be seen that brewing device 38 includes a disc shaped support member 50 formed to hold input member 46. Support member 50 has a lateral flange 52 and a recess portion 54 in which input membrane 46 is inserted. Lateral flange 52 of support member 50 is sealingly engaged with lower member 40 of brewing device 38. Support member 50 is made of a thin sheet of aluminum, nevertheless any other material known to one skilled in the art could be used without departing from the scope of the present invention.

[0028] Lower member 40 has a retaining portion 56 located on its periphery for sealingly mounting lower member 40 on edge 36 of cup shaped member 20, as it will be described more in details later. Retaining portion 56 has a groove 58 and an outward flange 60. Lower member 40 also has an aperture 62 located over input

membrane 46. Aperture 62 permits the insertion of an object therein through which an infusion liquid flows inside infusion chamber 44, as it will be described more in details later.

[0029] Brewing device 38 also includes a filter paper 64 that prevents infusion material to flow outside infusion chamber 44 into container portion 49 of cup shaped member 20. Filter paper 64 is placed against filter paper support 66. Filter paper support 66 has a central upper portion 76 and a retaining portion 68 for engagement with upper member 42 as it will be described more in details later. Retaining portion 68 is formed with an outward protruding rim 70, a groove 72, and an inward rim 74. Central upper portion 76 has a plurality of apertures 78 that permit infused liquid to flow outside infusion chamber 44 into container portion 49 of cup shaped member 20. Output membrane 48 rests against central upper portion 76 of paper filter support 66 and covers apertures 78.

[0030] Upper member 42 of brewing device 38 is in the form of a generally cylindrical member having downwardly extending lateral walls 82, merging with an outwardly flaring flange 92 that terminates into a U-shaped end 88 defining a groove 90. In addition upper member 42 has an upper surface 84 that is shaped to be engaged by filter paper support 66 as will be explained in more detail later and to define a recess 86 to dispose output membrane therein as shown as well as to enclose infusion chamber 44. U-shaped end 88 is snugly inserted into groove 58 and edge 38 of lateral walls 22 is engaged with into groove 90 so as to constitute a watertight assembly. In this manner, brewing device 38 is sealingly mounted in lower portion 30 of cup shaped member 20.

[0031] More particularly, upper surface 84 includes an upper retaining portion 94 and a central tilted portion 96. Upper retaining portion 94 includes an outward rim 98, a groove 100, and an inward rim 102 enabling to mount filter paper support 66 under upper member 42 as shown. Retaining portion 68 of filter paper support 66 is engaged under upper retaining portion 94 of upper member 42. To achieve this, outward protruding rim 70, groove 72, and inward rim 74 of filter paper support 66 are respectively engaged with outward rim 98, groove 100, and an inward rim 102 of upper member 42. Central tilted portion 96 has a plurality of apertures 104 that

permit infused liquid to flow outside infusion chamber 44 into container portion 49 of cup shaped member 20. Central portion 96 is tilted for insertion of output membrane 48 therein. As shown, the apertures 104 of central tilted portion 96 are located over output membrane 48. Central tilted portion 96 also has a recess 105 located in the middle thereof. Recess 105 applies pressure on output membrane 48 and prevents the deformation of the central portion of output membrane 48. Therefore, when pressure is applied on output membrane 48, as it will be described more in details later, central portion of output membrane 48 remains in contact with recess 105.

[0032] Referring now simultaneously to FIG. 5 and FIG. 6, it will be seen that a cup shaped member 20 including the brewing device 38 of the present invention is disposed on a infusion liquid filling base 106. A needle 110 or any other thin object which can carry a liquid extends through support member 50, input membrane 46 and inside aperture 52 of lower member 40 and injects a predetermined amount of an infusion liquid into infusion chamber 44. The infusion liquid, which is preferably water, gradually fills infusion chamber 44 until the latter is full. At this point, the sides of output membrane 48 are slightly separated from filter paper support 66 due to the pressure applied on the membrane by the infusion liquid and the latter can then flow into the container portion 49. Central portion of output membrane 48 is not deformed and remains in contact with recess 105 of upper surface 84. Once the container portion 49 of cup shaped member 20 is full, the needle is retracted from the support member 50 and input membrane 46. The cup is ready to be removed from filling base 106 for drinking the warm beverage.

[0033] Once the filling operation is terminated, the input membrane immediately reacts to close and seal the opening made by the needle or other thin object to prevent leakages from of the infused liquid. The pressure in the infusion chamber 44 returns to normal and the sides of output membrane 48 return to their original position, i.e. resting on the filter paper support 66 and, therefore, preventing liquid exchanges between the container portion 49 and the infusion chamber 44.

[0034] Preferably, input membrane 46 is pre-pierced to facilitate the insertion of needle 110 therein. As it will be easily understood by one skilled in the art, pre-

piercing input membrane 46 does not reduce the sealing properties of this membrane.

[0035] The cup shaped member and the brewing device are preferably disposable. Therefore, once the cup has been filled, the support member 50 has a small hole therein, caused by the needle, showing that this cup has already been used.

[0036] The infusion liquid filling base is preferably for hot water but can be used for other liquids at various temperatures. The cup shaped member preferably contains a single portion of the beverage. Therefore, the filling base is adapted to feed just enough infusion liquid to fill the cup shaped member when the latter is placed on the filling base. The filling base can also provide a much larger quantity of infusion liquid and to adapt thereto suitable control means, well known to those skilled in the art, to feed just enough infusion liquid to fill one cup shaped member.

[0037] The infusion material, such as ground coffee, can be directly disposed in the infusion chamber or can be disposed in a small bag (not shown) such as a tea bag.

[0038] A water filtering system (not shown) may be provided in the filling base to obtain purified water before infusion.

[0039] During the production of a coffee cup including a brewing device in accordance with the present invention, upper member 42, output membrane 48, filter paper support 66, and filter paper 64 are first mounted on the cup shape member 20 by engaging lower edge 36 into groove 90. Then, a portion of the infusion material is suitably disposed in the infusion chamber 44 and the lower member 40 including input membrane 46 and support member 50 are then mounted on cup shape member 20 by mounting groove 58 over U-shaped end 80 of upper member 42. Lower member 40 can be mounted immediately after filling the infusion chamber 44, even if the infusion material is warm when inserted. When the pressure in infusion chamber 44 becomes too high due to warm gases formed therein, the gas excess will be evacuated through the output membrane 48 as described earlier for the infused liquid.

[0040] It will be understood that numerous modifications thereto will appear to those skilled in the art. Accordingly, the above description and accompanying drawings

should be taken as illustrative of the invention and not in a limiting sense. It will further be understood that it is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within known or customary practice within the art to which the invention pertains and as may be applied to the essential features herein before set forth, and as follows in the scope of the appended claims.

CLAIM:

1. A device for infusing an infusable material with an infusion liquid and providing a drinkable portion of an infused liquid, which comprises
 - a cup shaped member having lateral walls and a bottom portion;
 - the bottom portion having an infusion chamber containing the infusable material;
 - a source of infusion liquid and means enabling communication between the source of infusion liquid and the infusion chamber;
 - the infusion chamber provided with one way inlet means and one way outlet means;
 - the one way inlet means arranged to force the infusion liquid into the infusion chamber and to infuse the infusable material therein;
 - the one way outlet means arranged to allow infused liquid to exit from the infusion chamber into the cup shaped member and to fill the cup shaped member; and
 - means to provide an amount of infusion liquid sufficient only to constitute the drinkable portion.
2. A cup for infusion beverages, comprising:
 - a cup shaped member having lateral walls with an upper portion and a lower portion;
 - an infusion chamber disposed in the cup shaped member, the infusion chamber having a first opening and a second opening;
 - a inlet membrane communicating with the first opening of the infusion chamber and sealingly mounted on the infusion chamber, the inlet membrane allowing the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid;

an outlet membrane communicating with the second opening of the infusion chamber and mounted on the infusion chamber, the outlet membrane allowing the passage of the infusion liquid outside the infusion chamber into the cup shaped member; and
securing means for sealingly mounting the infusion chamber on the cup shaped member.

3. A cup in accordance with claim 2, comprising an infusion material disposed in the infusion chamber.
4. A cup in accordance with claim 3, wherein the infusion material is coffee.
5. A cup in accordance with claim 2, comprising the infusion liquid and wherein the infusion liquid has been introduced into the cup through the input membrane.
6. A cup in accordance with claim 2, wherein the infusion chamber is sealingly mounted into the lower portion of the cup.
7. A brewing device for a cup shaped member, comprising:
an infusion chamber having a first opening and a second opening;
an inlet membrane communicating with the first opening of the infusion chamber and sealingly mounted on the infusion chamber, the inlet membrane allowing the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid;
an outlet membrane communicating with the second opening of the infusion chamber and mounted on the infusion chamber, the outlet membrane allowing the passage of the infusion liquid outside the infusion chamber into the cup shaped member; and

securing means for mounting the brewing device on the cup shaped member.

8. A device for providing a drinkable portion of an infused liquid, which comprises:

a cup shaped member having lateral walls with an upper portion and a lower portion;

an infusion chamber disposed in the cup shaped member, the infusion chamber having a first opening and a second opening;

an inlet membrane communicating with the first opening of the infusion chamber and sealingly mounted on the infusion chamber, the inlet membrane allowing the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid;

an outlet membrane communicating with the second opening of the infusion chamber and mounted on the infusion chamber, the outlet membrane allowing the passage of the infusion liquid outside the infusion chamber into the cup shaped member;

securing means for mounting the infusion chamber on the cup shaped member;

a source of infusion liquid;

liquid communication means permitting a liquid flow between the source of infusion liquid and the infusion chamber through the inlet membrane; and

controlling means to supply an amount of infusion liquid sufficient only to fill the cup shaped member.

9. A method to provide an infusion beverage, comprising:

providing a cup for infusion beverages in accordance with claim 2;

providing a source of infusion liquid;

providing liquid communication means permitting a liquid flow between the source of infusion liquid and the infusion chamber through the inlet membrane;

providing controlling means to supply an amount of infusion liquid sufficient only to fill the cup shaped member;

connecting the inlet membrane of the cup and the liquid communication means; and

activating the source of infusion liquid to generate the transfer of the amount of infusion liquid into the cup.

ABSTRACT

The present invention concerns a cup for infusion beverages which includes a brewing device that permits to produce fast, cheap, easy to manufacture, and good quality infusion beverages, such as coffee. The cup of the invention comprises a cup shaped member having lateral walls with an upper portion and a lower portion. An infusion chamber is disposed in the bottom portion of the cup shaped member and has a first opening and a second opening. An inlet and an outlet membranes communicate respectively with the first and the second openings of the infusion chamber. The inlet membrane is sealingly mounted on the infusion chamber and allows the introduction of an infusion liquid into the infusion chamber without allowing leakages of the introduced infusion liquid. The outlet membrane allows the passage of the infusion liquid outside the infusion chamber into the cup shaped member. The brewing device is sealingly mounted on the cup shaped member.

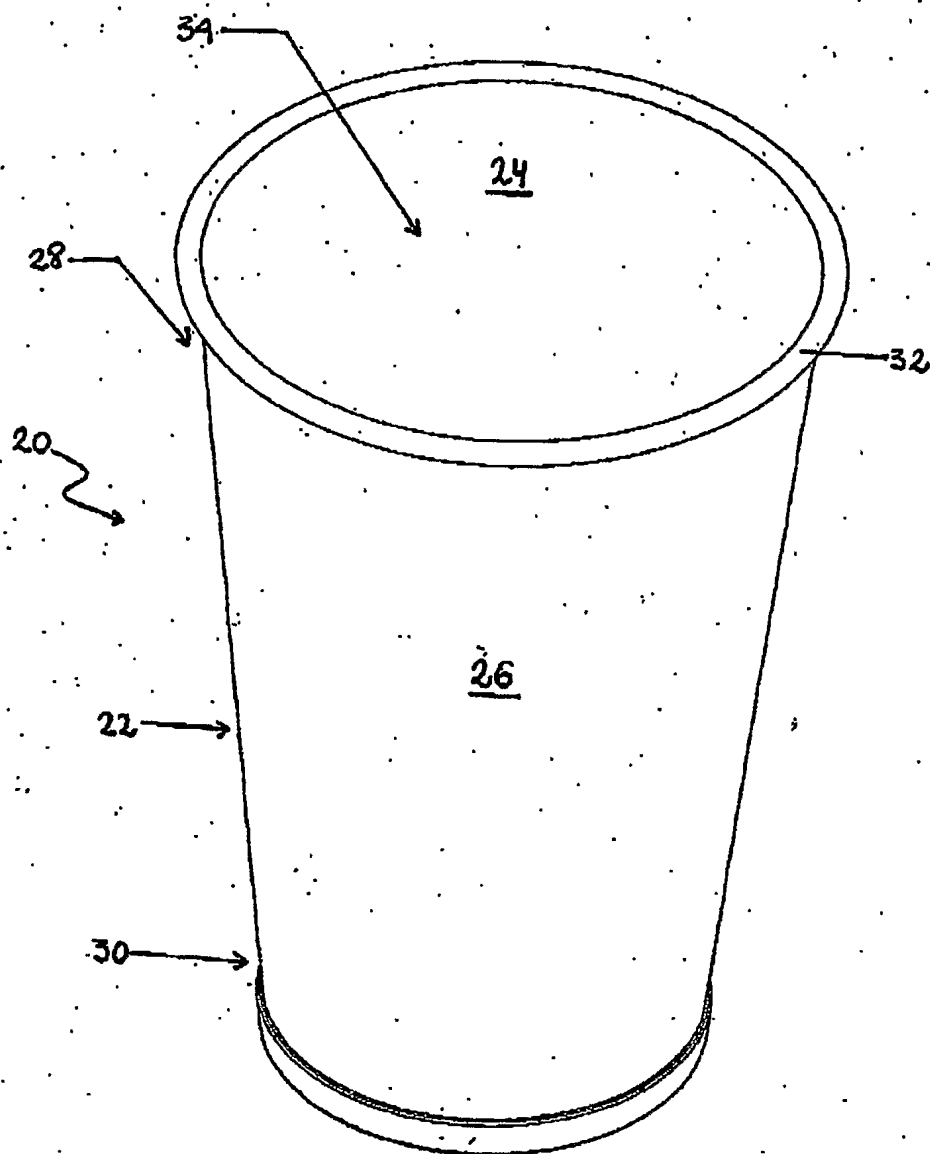


FIGURE 1

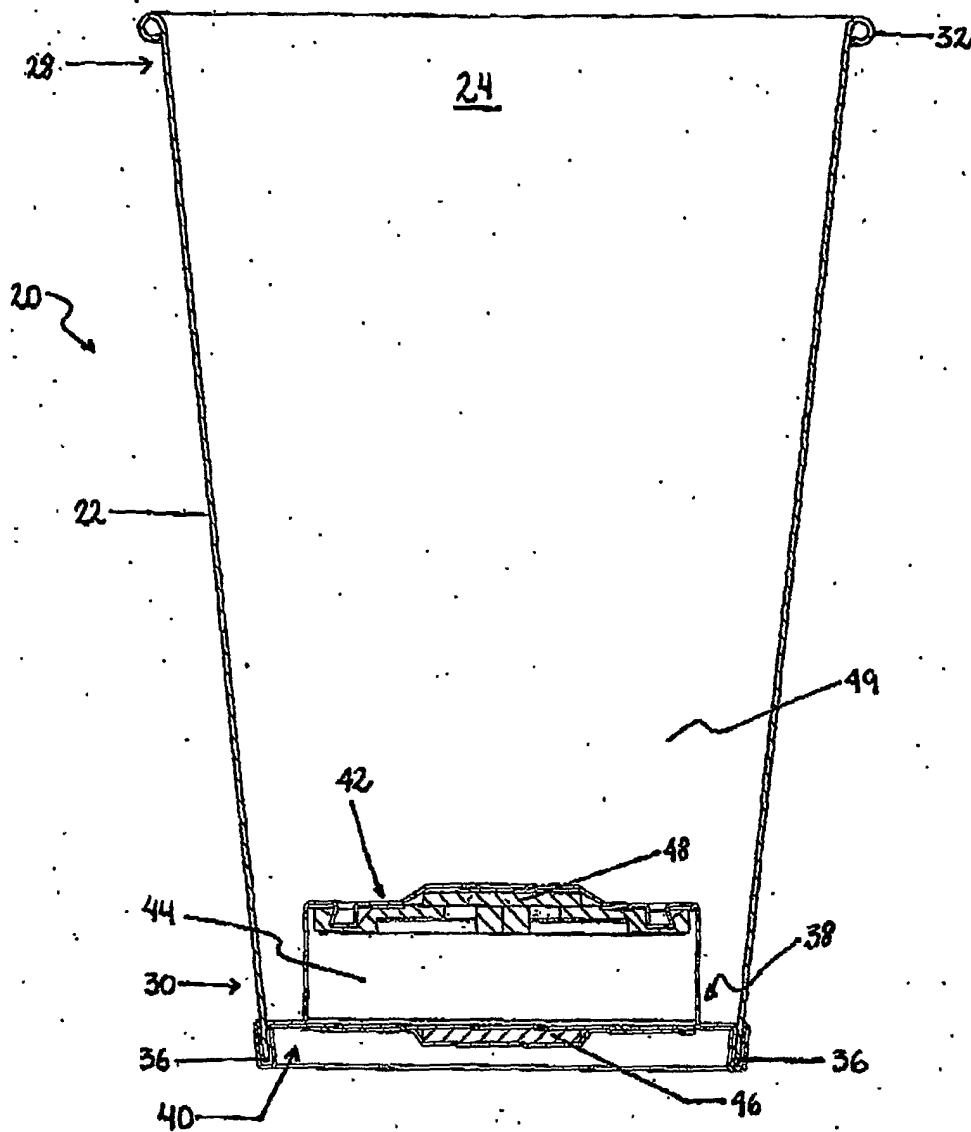


FIGURE 2

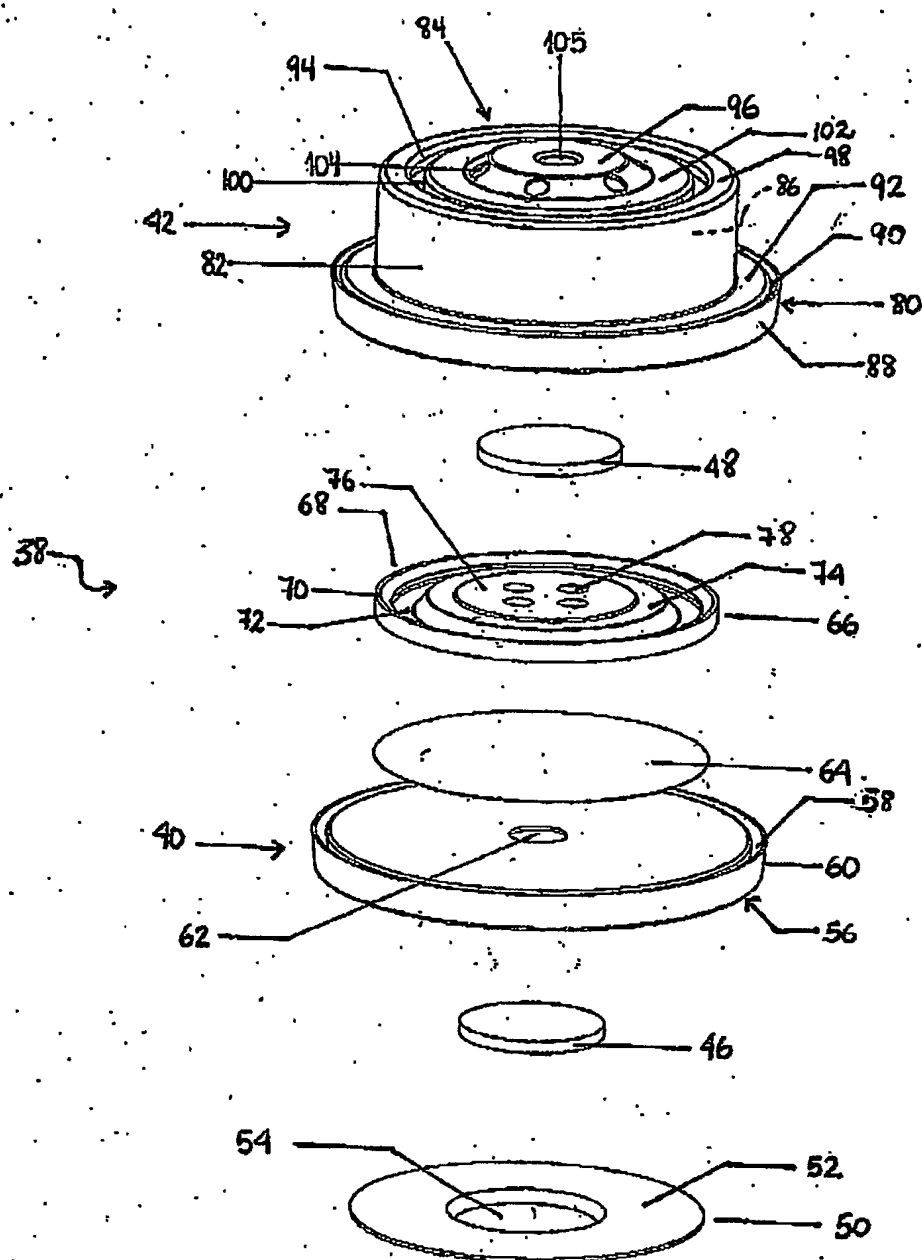


FIGURE 4

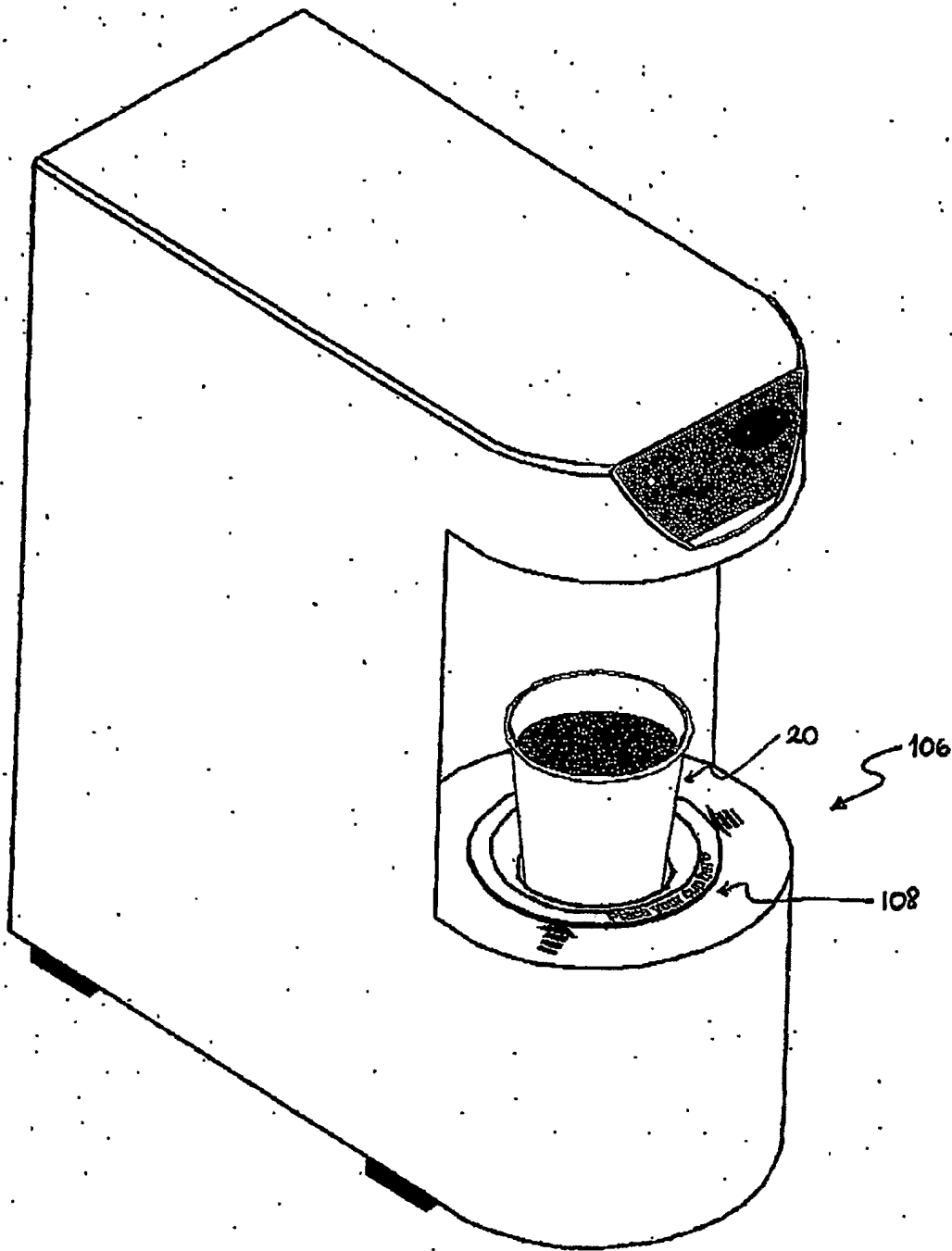


FIGURE 5

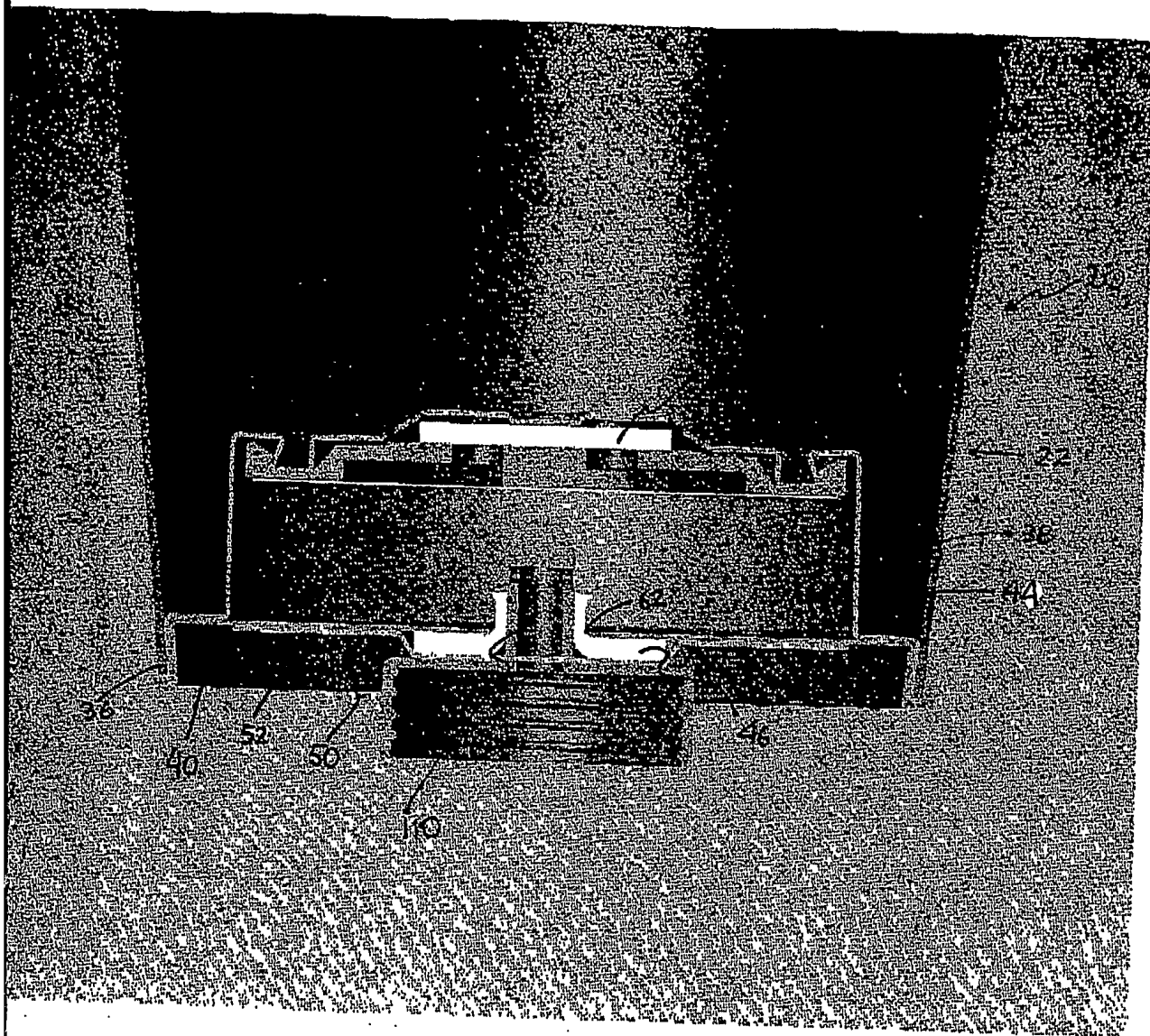


FIGURE 6

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